UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/855,297	05/15/2001	Konstantinos Amouris	1140-2	8798

7590 04/19/2005	EXAMINER
George Likourezos, Esq.	DAVIS, CYNTHIA L

ART UNIT	PAPER NUMBER
2665	

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DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *January 21, 2005*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-12,14 and 15* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 3-12, and 14-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments, filed on January 21, 2005, with respect to the

rejection(s)of claim(s) 1, 3-12, and 14-15, under 35 U.S.C. 103(a) as being

unpatentable over Garcia-Luna-Aceves in view of Sousa, have been fully considered

and are persuasive. Therefore, the rejection has been withdrawn. However, upon

further consideration, a new ground(s) of rejection is made in view of 35 U.S.C. 103(a)

as being unpatentable over Garcia-Luna-Aceves in view of Katz.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed
> or described as set forth in section 102 of this title, if the differences between the
> subject matter sought to be patented and the prior art are such that the subject
> matter as a whole would have been obvious at the time the invention was made
> to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was
> made.

2.   Claims 1, 3-12, and 14-15 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Garcia-Luna-Aceves in view of Katz.

Regarding claim 1, a method for allocating a set of time slots belonging to a

common TDMA channel to a network of transceiver nodes is disclosed in Garcia-Luna-

Aceves. Dividing the set of time slots into a plurality of time slot stub-sets is disclosed in

column 6, lines 56-57 and column 11, lines 33-43 (as ASL is the same as a slot sub-

set). Allocating time slot sub-sets to each one of said transceiver nodes is disclosed in

column 16, lines 56-58 (ASL's are allocated among nodes). Resolving time slot

allocation conflicts occurring when at least two transceiver nodes of said network of

transceiver nodes are allocated time slots belonging to an identical time slot sub-set and

the distance between said at least two transceiver nodes is less than a predetermined

threshold is disclosed in column 10, line 59-column 11, line 9, and column 14, lines 20-

26 (a conflict among requested ASL's could occur when a node moves within the two-

hop neighborhood, i.e., with in a predetermined distance that is related to the

transmission range of the nodes, of a node in the network that it had previously been a

three-hop neighbor of). Claim 1 further discloses that the time slot allocation is based

on node position in space, which is identified periodically, which is missing from Garcia-

Luna-Aceves. This is disclosed in Katz, column 2, lines 6-8 (disclosing a hybrid

SDMA/TDMA system, which would allocate time slots in a cell based on position). It

would have been obvious to one skilled in the art at the time of the invention to allocate

time slots based on node position. The motivation would be reduce interference among

nodes, and increase system capacity (see Katz, column 1, lines 30-33, and lines 55-57).

Regarding claim 12, a system for allocating a set of time slots belonging to a

common TDMA channel to a network of transceiver nodes is disclosed in Garcia-Luna-

Aceves. Means for dividing the set of time slots into a plurality of time slot stub-sets is

disclosed in column 6, lines 56-57 and column 11, lines 33-43 (an ASL is the same as a

slot sub-set). Means for allocating time slot sub-sets to each one of said transceiver

nodes is disclosed in column 16, lines 56-58 (ASL's are allocated among nodes).

Means for resolving time slot allocation conflicts occurring when at least two transceiver

nodes of said network of transceiver nodes are allocated time slots belonging to an identical time slot sub-set and the distance between said at least two transceiver nodes is less than a predetermined threshold is disclosed in column 10, line 59-column 11, line 9, and column 14, lines 20-26 (a conflict among requested ASL's could occur when a node moves within the two-hop neighborhood, i.e., with in a predetermined distance that is related to the transmission range of the nodes, of a node in the network that it had previously been a three-hop neighbor of). Claim 1 further discloses that the time slot allocation is based on node position in space, which is identified periodically, which is missing from Garcia-Luna-Aceves. This is disclosed in Katz, column 2, lines 6-8 (disclosing a hybrid SDMA/TDMA system, which would allocate time slots in a cell based on position). It would have been obvious to one skilled in the art at the time of the invention to allocate time slots based on node position. The motivation would be reduce interference among nodes, and increase system capacity (see Katz, column 1, lines 30-33, and lines 55-57).

Regarding claims 3 and 13, resolving time slot allocation conflicts comprising allocating to each one of the two transceiver nodes time slots belonging to a different time slot sub-set is disclosed in Garcia-Luna-Aceves, column 16, lines 58-60.

Regarding claims 4 and 14, the periodically identified set of space coordinates corresponding to each transceiver node's current set of space coordinates is missing from Garcia-Luna-Aceves. This is disclosed in Katz, column 2, lines 6-8 (disclosing a hybrid SDMA/TDMA system, which would allocate time slots in a cell based on position). It would have been obvious to one skilled in the art at the time of the

invention to allocate time slots based on node position. The motivation would be reduce

interference among nodes, and increase system capacity (see Katz, column 1, lines 30-

33, and lines 55-57).

Regarding claim 5, using the time slots belonging to the common TDMA channel

for managing communication channel resources between a plurality of nodes of said

network of transceiver nodes is disclosed in Garcia-Luna-Aceves, column 14, lines 48-

61 (the nodes manage the resources by sending messages to each other on the

common channels).

Regarding claim 6, each node of said plurality of nodes communicating on

multiple channels on a time multiplex basis is disclosed in Garcia-Luna-Aceves, figure

1, and column 11, lines 33-43 (the time slots are on various channels).

Regarding claim 7, dividing each time slot of said set of time slots belonging to

said common TDMA channel into a plurality of time sub-slots, and designating one time

slot as a query time slot is disclosed in Garcia-Luna-Aceves, column 6, lines 55-59.

Each source node of said plurality of nodes desiring to send data to a destination sub-

set of each source node's respective set of neighboring nodes transmitting a query

packet including the identifier of each node of said destination sub-set during the query

time-slot is disclosed in column 12, lines 55-56.

Regarding claim 8, storing for each communicating node a transmit set of time

slot and channel pairs which can be used by the communicating node is disclosed in

Garcia-Luna-Aceves, column 12, lines 57-59 (if the node has this information to send

out in the schedule packet, it must have it stored). Storing for each communicating

node a receive set of time slot and channel pairs which can be used by said each

communicating node to receive data from each communicating node's set of

neighboring nodes is disclosed in column 13, lines 67 (an ISR is an idle slot range).

Communicating a portion of the stored time slot and channel pair data between said

each source node and said destination sub-set during the subsequent time sub-slots of

said allocated time slot is disclosed in column 6, lines 55-59 (the exchange of

scheduling packets communicates the stored information).

Regarding claim 9, the query packet further including a selected sub-set of said

transmit set of time slot and channel pairs stored for each destination node is disclosed

in Garcia-Luna-Aceves, column 12, lines 64-65 (the schedule priority ticket shows which

time slot and channel pairs are in the selected sub-set. Higher priority ASL's would be

selected).

Regarding claim 10, identifying by each destination node an assignment set of

time slot and channel pairs belonging to both the selected sub-set of said transmit set of

time slots and channel pairs included in the query control packet and the receive set of

time slot and channel pairs stored for each destination node is disclosed in Garcia-

Luna-Aceves, column 14, lines 60-61 (the node can request based on matchups

between its desired ASL's and its neighbors' advertised ISR's). Sending by each

destination node a response packet including said assignment set of time slot and

channel pairs on which each destination node desired to receive data from said each

source node, and receiving by each source node said response packet including said

assignment set of data is disclosed in column 16, lines 56-58. Sending by each source

node a confirmation packet including said assignment set of time slot and channel pairs which said each source node uses to transmit data to said each source node is disclosed in column 16, lines 56-60 (the confirmation packet is the next scheduling packet, which has the request bit changed).

Regarding claim 11, each neighboring node of said each destination node receiving said response packet identifying in the transmit set of time slot and channel pairs stores for each neighboring node of said each destination node the time slot and channel pairs belonging to said assignment set of time slot and channel pairs is disclosed in Garcia-Luna-Aceves, column 14, lines 60-61 (the source node only requests based on matchups between its desired ASL's and its neighbors' advertised ISR's, so every request the neighboring nodes receive contains time slot and channel pairs that are in the assignment set). Each neighboring node of said each source node receiving said confirmation packet identifying in the receive set of time slot and channel pairs stored for said each neighboring node of said each source node the time slot and channel pairs belonging to said assignment set of time slot and channel pairs is disclosed in column 16, lines 56-60 (the confirmation packet is the next scheduling packet, which has the request bit changed. This will only happen for time slot and channel pairs that are in the assignment set).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia L Davis whose telephone number is (571) 272-3117. The examiner can normally be reached on 8:30 to 6, Monday to Thursday.
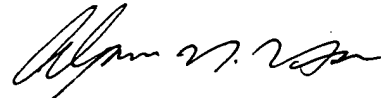
If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Huy Vu can be reached on (703) 272-3155. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

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Business Center (EBC) at 866-217-9197 (toll-free).

CLD
4/15/2005

ALPUS H. HSU
PRIMARY EXAMINER